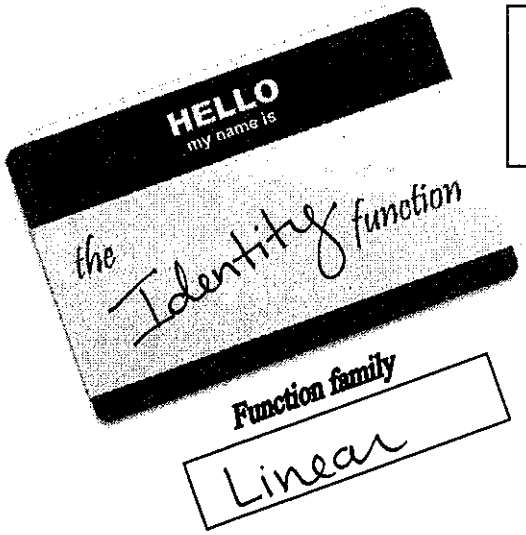
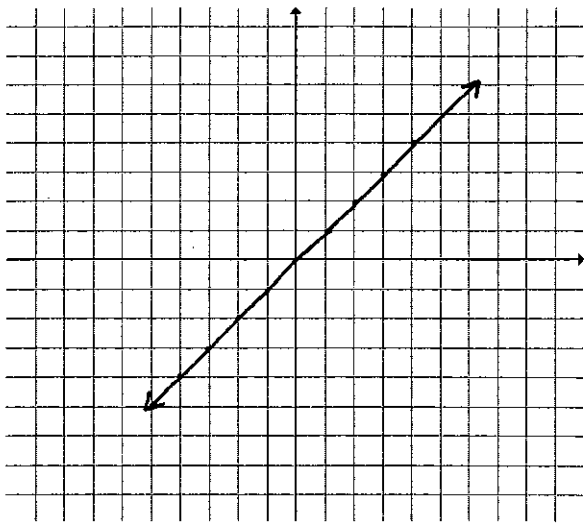


Equation

$f(x) =$ x

Table of key values

x	$f(x)$
0	0
-1	-1
1	1
2	2
-2	2

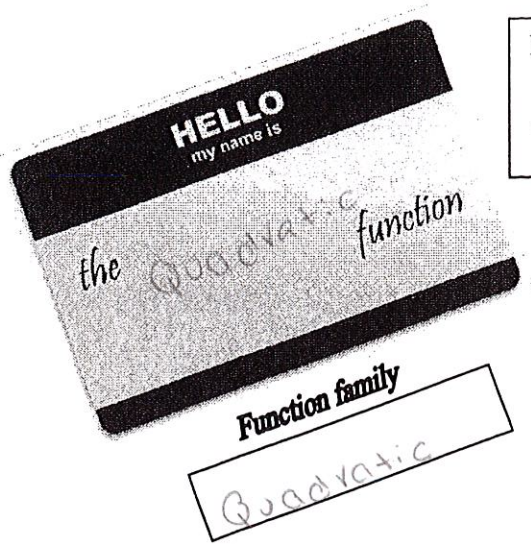


Domain $(-\infty, \infty)$	Range $(-\infty, \infty)$
x-intercept(s) 0	y-intercept 0
equation(s) of asymptote(s) N/A	even/odd/neither and any symmetry Odd $f(-x) = -f(x)$
as $x \to \infty$, $f(x) \to$ ∞	as $x \to -\infty$, $f(x) \to$ $-\infty$
intervals on which $f(x)$ is increasing $(-\infty, \infty)$	intervals on which $f(x) > 0$ $(0, \infty)$
intervals on which $f(x)$ is decreasing none	intervals on which $f(x) \leq 0$ $(-\infty, 0]$
relative maximum values and the x-values where they occur None	relative minimum values and the x-values where they occur none

Other notes?

Not all linear equations are always increasing. (positive slope)

Not all linear equations are odd.

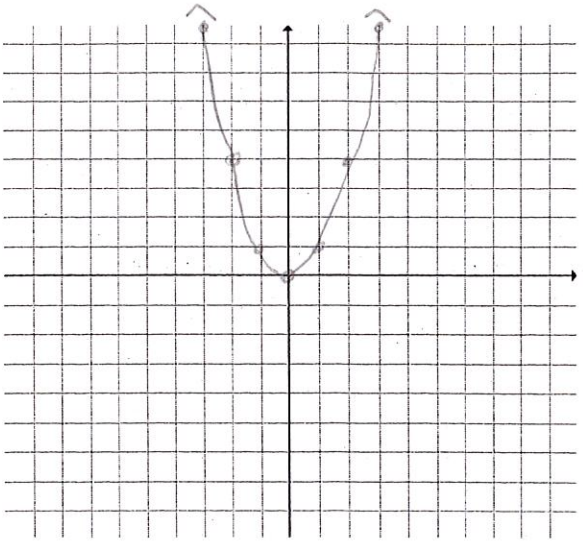


Equation

$f(x) = x^2$

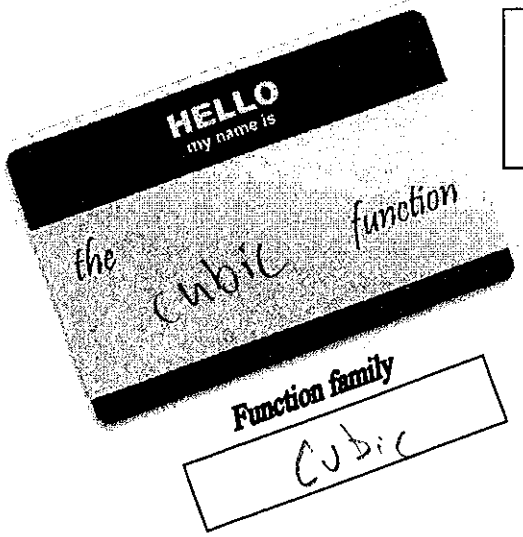
Table of key values

x	$f(x)$
0	0
-1	1
-2	4
1	1
2	4



Domain	Range
$(-\infty, +\infty)$	$[0, +\infty)$
x-intercept(s)	y-intercept
$[0, 0]$	$[0, 0]$
equation(s) of asymptote(s)	even/odd/neither and any symmetry
N/A	even
as $x \to \infty$, $f(x) \to$	as $x \to -\infty$, $f(x) \to$
$+\infty$	$+\infty$
intervals on which $f(x)$ is increasing	intervals on which $f(x) > 0$
$[0, \infty)$	$(0, \infty) \cup (-\infty, 0)$
intervals on which $f(x)$ is decreasing	intervals on which $f(x) \leq 0$
~~N/A~~ $(-\infty, 0]$	$(0, 0)$
relative maximum values and the x-values where they occur	relative minimum values and the x-values where they occur
~~absolute min @ (0,0)~~ none	0 ✓

Other notes?

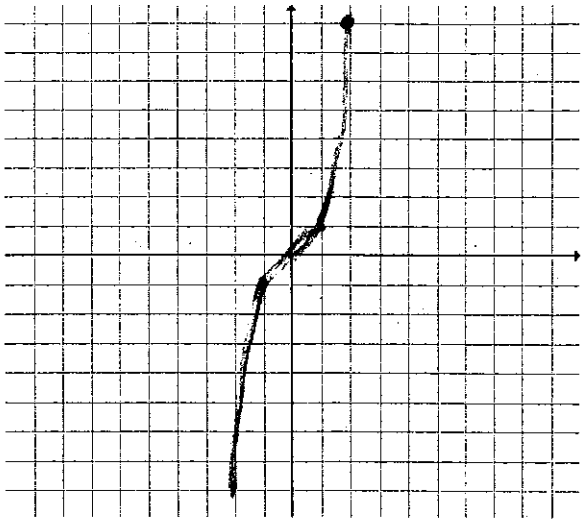


Equation

$f(x) = x^3$

Table of key values

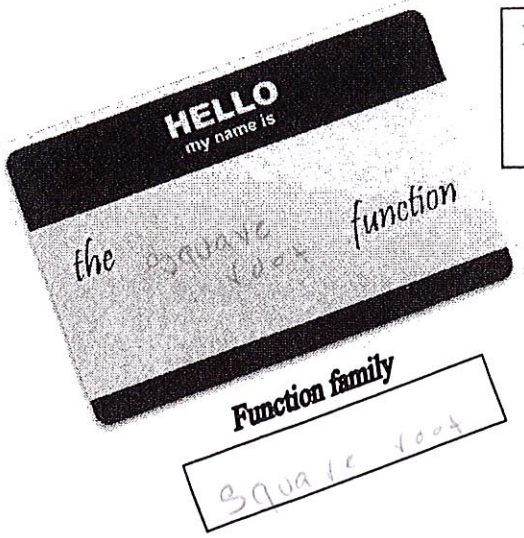
x	$f(x)$
1	1
2	8
3	27
-1	-1
-2	-8
-3	-27



Domain $(-\infty, \infty)$	Range $(-\infty, \infty)$
x-intercept(s) 0	y-intercept 0
equation(s) of asymptote(s) N/A	even/odd/neither and any symmetry odd, negatively symmetric
as $x \to \infty$, $f(x) \to \infty$	as $x \to -\infty$, $f(x) \to -\infty$
intervals on which $f(x)$ is increasing $(-\infty, \infty)$	intervals on which $f(x) > 0$ $(0, \infty)$
intervals on which $f(x)$ is decreasing N/A	intervals on which $f(x) \leq 0$ $(-\infty, 0]$
relative maximum values and the x-values where they occur None	relative minimum values and the x-values where they occur None

Other notes?

✓

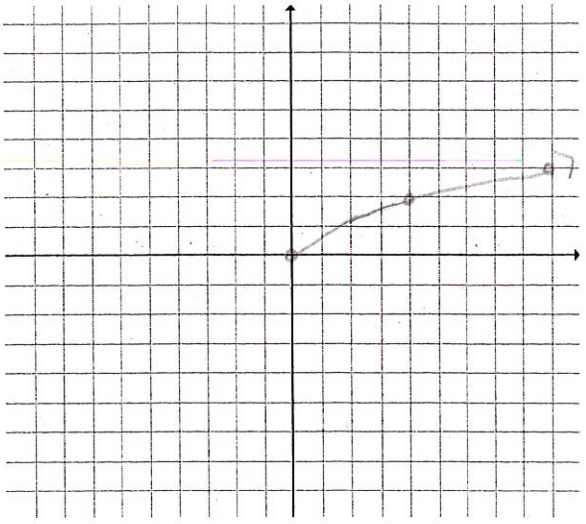


Equation

$f(x) = \sqrt{x}$

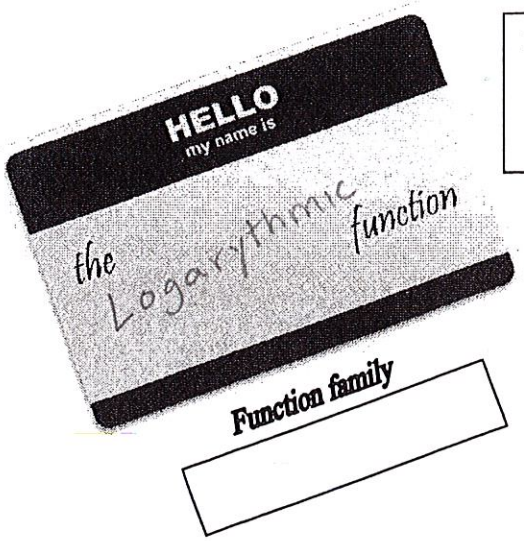
Table of key values

x	$f(x)$
0	0
4	2
9	3
16	4



Domain	Range
$[0, +\infty)$	$[0, +\infty)$
x-intercept(s) 0	y-intercept 0
equation(s) of asymptote(s) N/A	even/odd/neither and any symmetry neither
as $x \to \infty$, $f(x) \to$ ∞	as $x \to -\infty$, $f(x) \to$ n/a or DNE
intervals on which $f(x)$ is increasing $[0, +\infty)$	intervals on which $f(x) > 0$ $(0, +\infty)$
intervals on which $f(x)$ is decreasing N/A	intervals on which $f(x) \leq 0$ $(0, 0)$
relative maximum values and the x-values where they occur n/a	relative minimum values and the x-values where they occur 0 ✓

Other notes?

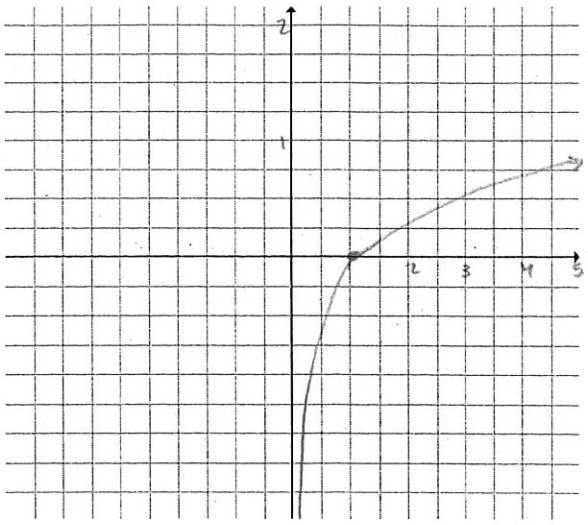


Equation

$f(x) = \log_a x$

Table of key values

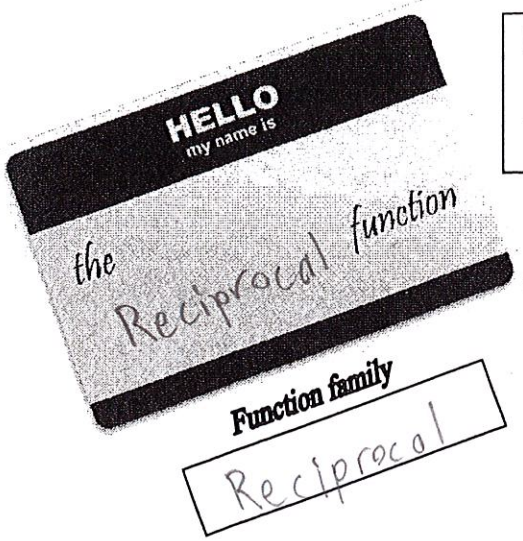
x	$f(x)$
1	0
10	1



Domain $(0, \infty)$ ✓	Range $(-\infty, \infty)$ ✓
x-intercept(s) $(1, 0)$ ✓	y-intercept N/A
equation(s) of asymptote(s) $x = 0$ ✓	even/odd/neither and any symmetry neither / no symmetry
as $x \to \infty$, $f(x) \to \infty$ ✓	as $x \to -\infty$, $f(x) \to$ ~~$\emptyset$~~ DNE * never approaches $-\infty$
intervals on which $f(x)$ is increasing ~~$(-\infty, \infty)$~~ $(0, \infty)$	intervals on which $f(x) > 0$ $(1, \infty)$ ✓
intervals on which $f(x)$ is decreasing N/A	intervals on which $f(x) \leq 0$ ~~$(-\infty, 1]$~~ $(0, 1]$
relative maximum values and the x-values where they occur N/A	relative minimum values and the x-values where they occur N/A

Other notes?

- opposite of an exponential function
- NEVER touches the Y-axis



Function family

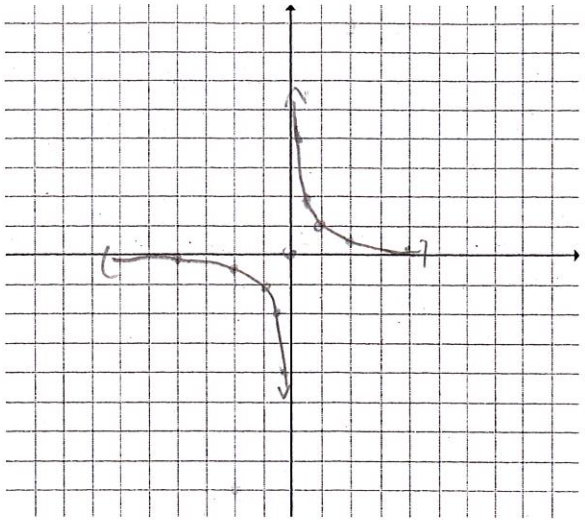
Reciprocal

Equation

$f(x) = \frac{1}{x}$

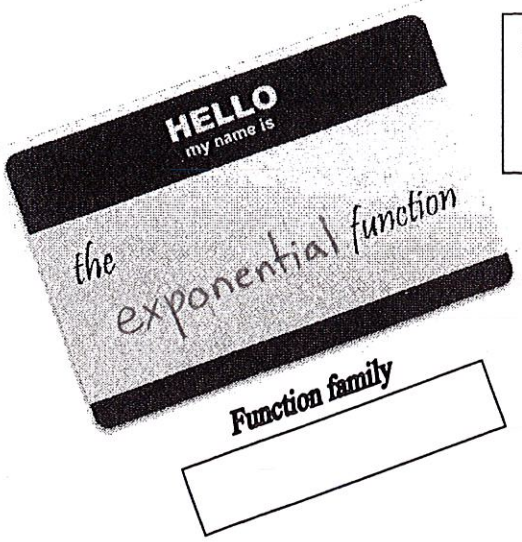
Table of key values

x	$f(x)$
0	0
1	1
1	-1
2	.5
.5	2
-2	-.5
-.5	-2



Domain $(-\infty,0)\cup(0,\infty)$ ✓	Range $(-\infty,0)\cup(0,\infty)$ ✓
x-intercept(s) None ✓	y-intercept None ✓
equation(s) of asymptote(s) $x=0$ $y=0$ ✓	even/odd/neither and any symmetry ✓
as $x \to \infty$, $f(x) \to$ 0 ✓	as $x \to -\infty$, $f(x) \to$ 0 ✓
intervals on which $f(x)$ is increasing None ✓	intervals on which $f(x) > 0$ $(0,\infty)$ ✓
intervals on which $f(x)$ is decreasing $(-\infty,0)\cup(0,\infty)$ ✓	intervals on which $f(x) \le 0$ $(-\infty,0)$ ✓
relative maximum values and the x-values where they occur None ✓	relative minimum values and the x-values where they occur None ✓

Other notes?

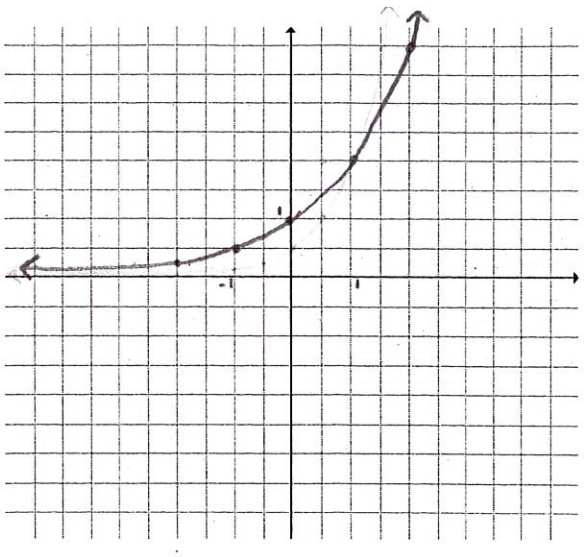


Equation

$f(x) = a^x$

Table of key values

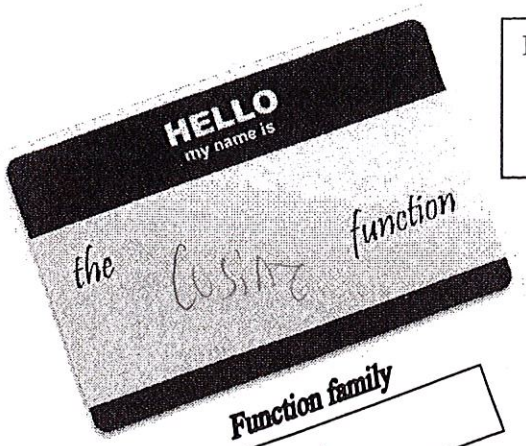
x	$f(x)$
0	1
1	2
2	4
-1	$\frac{1}{2}$
-2	$\frac{1}{4}$



Domain $(-\infty, \infty)$ ✓	Range $(0, \infty)$ ✓
x-intercept(s) none ✓	y-intercept $(0,1)$ ✓
equation(s) of asymptote(s) $y=0$ ✓	even/odd/neither and any symmetry neither / no symmetry ✓
as $x \to \infty$, $f(x) \to \infty$ ✓	as $x \to -\infty$, $f(x) \to 0$ ✓
intervals on which $f(x)$ is increasing $(-\infty, \infty)$ ✓	intervals on which $f(x) > 0$ $(-\infty, \infty)$ ✓
intervals on which $f(x)$ is decreasing N/A ✓	intervals on which $f(x) \leq 0$ N/A ✓
relative maximum values and the x-values where they occur N/A ✓	relative minimum values and the x-values where they occur N/A ✓

Other notes?

- Opposite of logarithmic function
- NEVER touches x-axis



Function family

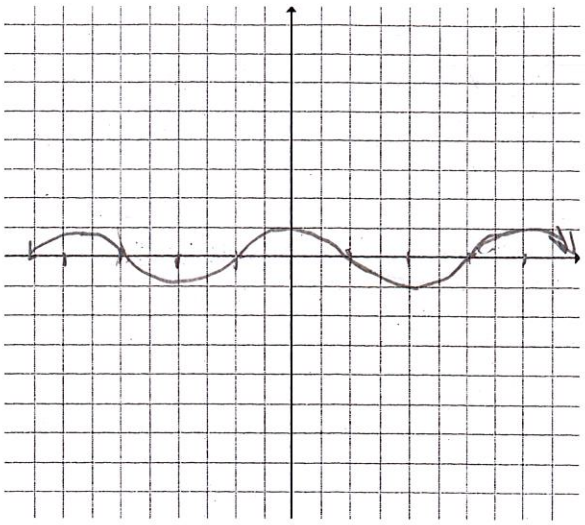
Cosine

Equation

$f(x) = \cos x$

Table of key values

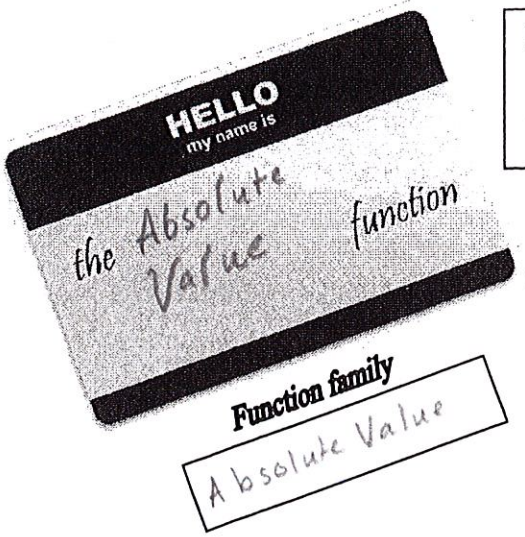
x	$f(x)$



Domain $(-\infty, \infty)$ All reals ✓	Range $[-1, 1]$ ✓
x-intercept(s) ~~$(-3, -1, 1, 3)$~~ $\frac{\pi}{2} \cdot n$ n = all integers	y-intercept 1 ✓
equation(s) of asymptote(s) N/a	even/odd/neither and any symmetry Even with respect to the Y-axis. ✓
as $x \to \infty$, $f(x) \to$ Oscillate between -1 and 1 and approach no limit. ✓	as $x \to -\infty$, $f(x) \to$ Oscillate between -1 and 1 and approach no limit. ✓
intervals on which $f(x)$ is increasing $(\pi, 2\pi)$ repeats every 2π ←	intervals on which $f(x) > 0$ $[-\frac{1}{2}\pi, \frac{1}{2}\pi]$ Over 0 for every 2π ✓
intervals on which $f(x)$ is decreasing $(0, \pi)$ repeat every 2π ←	intervals on which $f(x) \leq 0$ $[\frac{1}{2}\pi, \frac{3}{4}\pi]$ $-\frac{\pi}{2}$ Does this every 2π
relative maximum values and the x-values where they occur Absolute maximum 1 ✓	relative minimum values and the x-values where they occur Absolute minimum, -1

Other notes?

1.57
+ 3.14
4.71
+ 1.57
6.28



Function family

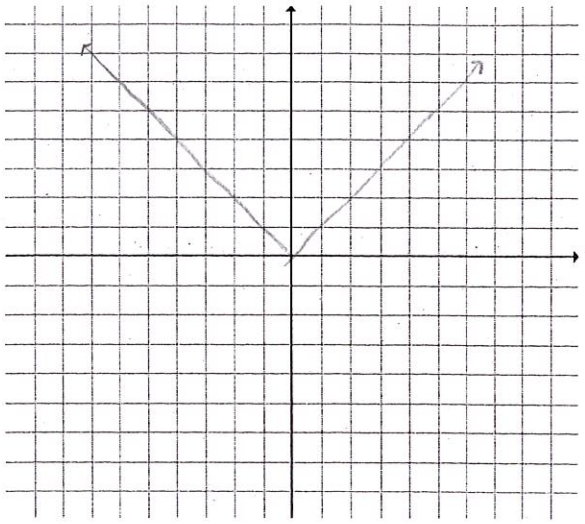
Absolute Value

Equation

$f(x) = |x|$

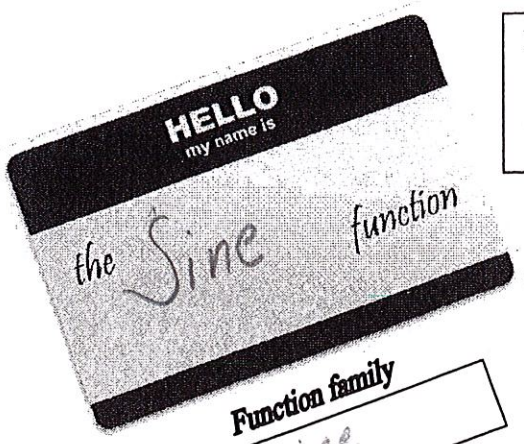
Table of key values

x	$f(x)$
-3	3
-2	2
-1	1
0	0
1	1
2	2
3	3



Domain $(-\infty, \infty)$ ✓	Range $[0, \infty)$ ✓
x-intercept(s) $(0,0)$ ✓	y-intercept $(0,0)$ ✓
equation(s) of asymptote(s) none ✓	even/odd/neither and any symmetry even ✓
as $x \to \infty$, $f(x) \to \infty$ ✓	as $x \to -\infty$, $f(x) \to \infty$ ✓
intervals on which $f(x)$ is increasing $[0, \infty)$ ✓	intervals on which $f(x) > 0$ $(-\infty, 0) \cup (0, \infty)$ ✓
intervals on which $f(x)$ is decreasing $(-\infty, 0]$ ✓	intervals on which $f(x) \leq 0$ $(0,0)$ ✓
relative maximum values and the x-values where they occur none ✓	relative minimum values and the x-values where they occur $(0,0)$ ✓

Other notes? general equation cannot have a negative f(x) value at a right angle



Function family

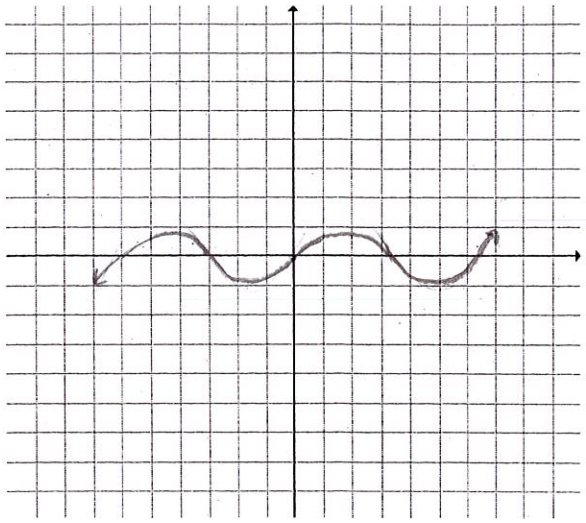
sine

Equation

$f(x) = \sin x$

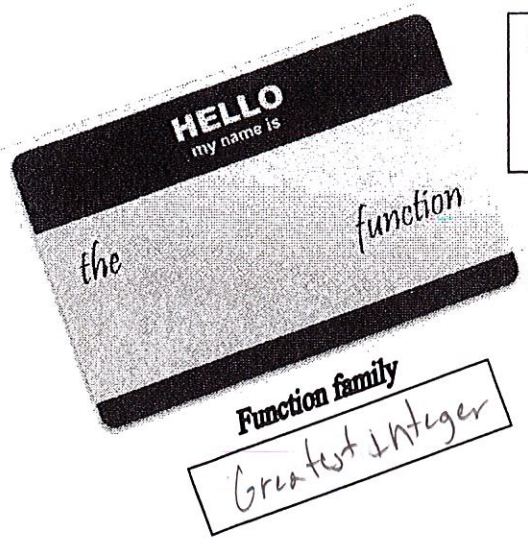
Table of key values

x	$f(x)$
-2π	0
$-\pi$	0
0	0
π	0
2π	0



Domain $(-\infty, \infty)$ ✓	Range $[-1, 1]$ (?) ✓
x-intercept(s) $n\pi$, n = any integer ✓	y-intercept $(0,0)$ ✓
equation(s) of asymptote(s) none ✓	even/odd/neither and any symmetry odd ✓
as $x \to \infty$, $f(x) \to$ oscillates between 1 & -1 ✓	as $x \to -\infty$, $f(x) \to$ oscillates between 1 & -1 ✓
intervals on which $f(x)$ is increasing $[-\frac{1}{2}\pi, \frac{1}{2}\pi]$ ✓ (repeats ~~$\frac{1}{2}$~~ 2π) ✓	intervals on which $f(x) > 0$ $(0, \pi)$ (repeats every 2π) ✓
intervals on which $f(x)$ is decreasing $[\frac{1}{2}\pi, 1\frac{1}{2}\pi]$ ✓ (repeats ~~$\frac{1}{2}$~~ 2π)	intervals on which $f(x) \leq 0$ $[\pi, 2\pi]$ (repeats every 2π) ✓
relative maximum values and the x-values where they occur 1 $x =$ ~~infinite~~ $\frac{\pi}{2}$ repeat 2π	relative minimum values and the x-values where they occur -1 $x =$ ~~infinite~~ $\frac{3}{2}\pi$ repeat every 2π

Other notes? goes through origin (not the same as cosine)

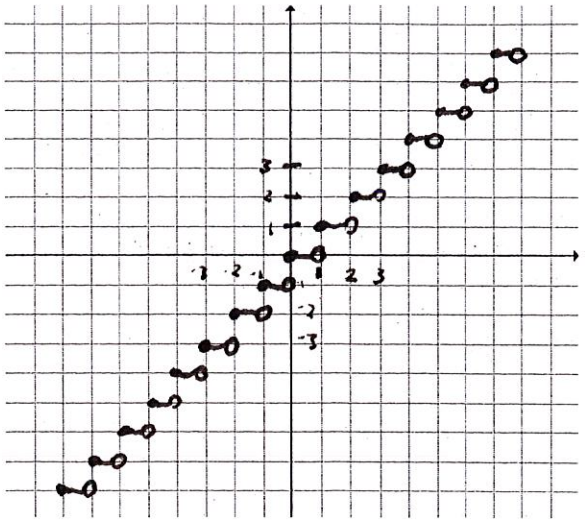


Equation

$f(x) =$ int(x) = [x]

Table of key values

x	$f(x)$
0	0
1	1
2	2
-1	-1
-2	-2



Domain $(-\infty, \infty)$ ✓	Range Only ~~int~~ integers ✓
x-intercept(s) $0 \le x < 1$ ✓ $[0,1)$	y-intercept $(0,0)$ ✓
equation(s) of asymptote(s) N/A	even/odd/neither and any symmetry neither
as $x \to \infty$, $f(x) \to \infty$ ✓	as $x \to -\infty$, $f(x) \to -\infty$ ✓
intervals on which $f(x)$ is increasing None	intervals on which $f(x) > 0$ $[1, \infty)$
intervals on which $f(x)$ is decreasing None ✓	intervals on which $f(x) \le 0$ $(-\infty, 0]$ ✓
relative maximum values and the x-values where they occur no rel max ✓	relative minimum values and the x-values where they occur no rel min ✓

Other notes?